STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT KENTUCKY 40601
www.kentucky.gov

February 23, 2011

The Honorable Dennis Revlett, Mayor
City of Livermore
P.O. Box 279, 105 W 3rd Street
Livermore, KY 42352

RE: City of Livermore
AI # 3107
City of Livermore Sewer Infrastructure
Rehab GPR

Dear Mayor Revlett:

Thank you for submitting a Green Project Reserve (GPR) business case for your proposed project, funded through the Clean Water State Revolving Fund (CWSRF). A provision of the 2011, CWSRF funding cycle requires that to the extent there are eligible project applications; states shall use 20% of its Clean Water State Revolving Fund capitalization grant for green infrastructure projects. These projects are intended to address water and energy efficiency improvements or other environmentally innovative activities. The Kentucky Division of Water (KY DOW) has reviewed the GPR business case for the City of Livermore Sewer Infrastructure Project, and has found the justification to be acceptable. If the scope of the project is altered in any way to exclude the GPR eligible components, the City of Livermore shall submit the changes in writing to the KY DOW and receive prior approval in writing before proceeding with construction.

We look forward to working with you in finalizing your wastewater infrastructure project. If you have any questions regarding this correspondence, please contact me at (502) 564-3410, ext 4832.

Sincerely,

Greg Goode, P.E.
Kentucky Division of Water

Cc: Louis Robbins, P.E., GRW
CWSRF File

GREEN COMPONENT SUPPLEMENT TO THE 2011 CWSRF AND DWSRF CALL FOR PROJECTS

During the 2011 Call for Projects held October 2009 through March 2010, the below referenced project was identified as "green" or included "green" components. In order to determine the green costs and whether or not the project is considered categorically green or whether a business case will be required, the Division of Water needs additional information.

Attached to this email is the current Green Guidance for the 2011 funding cycle. Green projects are classified as projects that address: Water Efficiency, Energy Efficiency, Green Infrastructure or Environmentally Innovative Activities. The guidance discusses each of these categories and the components or types of projects that would require a business case versus a classification of categorically green.

Please review the attached guidance and complete the below information. **In order for green merits of the project to be included as such on the 2011 Priority List, this form must be completed and returned via email to Division of Water no later than May 17, 2010.** Questions or completed forms should be submitted to the Division of Water contacts noted below:

Clean Water SRF
Anshu Singh
Anshu.singh@ky.gov
502-564-3410 ext. 4805

Drinking Water SRF
Amanda Yeary
Amanda.yeary@ky.gov
502-564-3410 ext. 4839

Note: An itemized list of components and their related costs are all that is required at this time.

Applicant (Must be governmental entity): City of Livermore

Project Name: Livermore Rehabilitation Project

WX / SX Number (required): _____

Please provide contact information for questions relating to this form only:

Contact Name: Louis Robbins
Email: lrobbins@grwinc.com
Telephone: 615-366-1800

1) Based on the attached guidance, do you consider your project a 100% green project?

Yes _____ No ✓

2) Based on the attached guidance, please categorize your green components into the identified categories and provide a listing of the green components and an estimation of related costs at this time:

a. Water Efficiency $ 0 (total)

Breakdown of components included with related costs:

Component	Cost

b. Energy Efficiency $ 1,493,840 (total)

Breakdown of components included with related costs:

Component	Cost
sewer line rehab & manhole rehab	1,493,840

c. Green Infrastructure $ 0 (total)

Breakdown of components included with related costs:

Component	Cost

d. Environmentally Innovative Activities

Breakdown of components included with related costs:

Component	Cost

3) Total Project Cost related to "green" components (all categories): $ 1,493,840

Note: Rehab project to reduce I/I to sewer system will reduce total flows thus reducing pumping costs & treatment costs. Guidance indicates this classification as a green project is not automatic but requires a "business case" for qualification as a green project.

404 BNA Drive
Suite 201
Nashville, TN 37217
Tel 615 / 366-1600
Fax 615 / 366-0406

GRW Engineers, Inc.

Engineering
Architecture
Planning
GIS
Aviation Consultants

Arlington, TX
Chattanooga, TN
Cincinnati, OH
Columbus, OH
Indianapolis, IN
Knoxville, TN
Lexington, KY
Louisville, KY

February 15, 2011

Amanda Yeary
Engineering Section, Water Infrastructure Branch
KY Division of Water
200 Fair Oaks
Frankfort, KY 40601
502-564-3410 x 4839
Email: amanda.yeary@ky.gov

Re: Business Case Analysis for Green Project
Sewer Infrastructure Rehab for Livermore, Kentucky

Dear Ms. Yeary:

Livermore, KY has an aging sewer infrastructure that is in need of immediate attention. The City's main sewage pumping station (SPS) and many of the city's sewer collection lines have deteriorated, thus becoming very inefficient for service to the customers and a burden for excessive maintenance requirements. Replacement of the SPS and rehab of the sewer collection system are needed.

We have gathered information about the existing system (condition and flows) and have prepared an analysis for this project to be funded under the State's Green Project Reserve funding program. The Green Project Reserve Business Case and supporting calculations are attached to this request.

Based on the information provided in this business case analysis and on behalf of the City of Livermore, we request that this project qualify as part of the 20% Green Project Reserve.

If you have any questions or comments regarding this project, please do not hesitate to contact me.

Sincerely,

Louis E. Robbins, P.E.

Enclosures

cc: City of Livermore
Sheryl Chino, GRADD
File 7664-02 A

Printed on recycled paper

Sewage Pump Station Replacement and Sewer Line Rehabilitation

Summary

- SPS replacement and sewer line rehabilitation project includes replacement of the main SPS and rehab of sewer collection lines and sewer manholes.
- Estimated energy savings of approx. 45% or approx. $2,781 per year.
- Elimination of approx. 23,000,000 gallons of WWTP discharge per year into surface waters.
- Additional energy savings along with other benefits of reducing flow into WWTP by approx. 23,000,000 gallons per year; reduces wear and maintenance requirements on pumping and other equipment.

Background

- The main SPS is about 28 years old and in need of replacement due to deterioration, reduction of reliability due to excessive maintenance requirements. The existing pumps are estimated to operate at an approx. wire-to-water efficiency of 42.5% (down from an estimated 55% when new).
- Estimated total flow pumped to the WWTP of 106,215,000 gallons per year includes approx. 77,380,000 gallons of I/I per year.
- Estimated energy consumed by the existing SPS with the existing flow conditions is 77,839 KWH per year.

Results

- The proposed new pumps will have a rated efficiency of 65% hydraulic with a premium efficiency motor rating of 93% for a wire-to-water efficiency of approx. 60%.
- With an effective rehab removal of 30% of the I/I, flows pumped to the WWTP should be reduced by approx. 23,214,000 gallons.

Calculated Energy Efficiency Improvements

- Pumping efficiencies should be improved from approx. 42.5% to 60% for a 41% increase in pumping efficiency. This level of efficiency exceeds the 20% recommended minimum improvement.
- Replacement of the pumps reduces the SPS energy usage by approx. 29%; the combination of pump replacement and rehab should reduce the energy usage by approx. 45% at the main SPS.
- The total energy usage should be reduced from approx. 77,839 KWH per year to 43,079 KWH per year.

Conclusions

- By pump replacement and sewer line rehab, the system should reduce energy use by 34,760 KWH per year for a cost savings of approx. $2,781 per year. Additional savings should result from the use of VFD's for the new pumps, which will better match the pumped flow to the actual flow.
- The combination of more consistent flow (with the use of VFD's) and reduced I/I flows to the WWTP should allow for additional savings in the operation of the WWTP and reduced maintenance costs associated with operation of the pumping equipment.
- Reduction of excess I/I amounts will also eliminate the discharge of this flow to the surface waters and reduce the level of pollutants in the environment.

Note: See attached worksheet for detailed calculations supporting the above information.

PROJECT Livermore, KY SHEET 1 OF 1

SUBJECT Business Case Calculations DATE 2/10/11

JOB NO. 7664-02

BY JER

Existing Flow Conditions (Sewer System)

Avg. Flow June 2009 to May 2010 ⇒ 0.291 mgd ⇒ 106,215,000 gal/yr.

Dry Weather Base Flow (July - Oct. 2010) ⇒ 0.079 mgd avg. for 4 mos.

I/I Flows over 12 mos. ⇒ 0.291 mgd - 0.079 mgd ⇒ 0.212 mgd (I/I avg.)
0.212 mgd x 365 days ⇒ 77,380,000 gal. of I/I per year

2003 Report estimated that 30% of I/I could be removed by rehab
77,380,000 gal x 30% removal ⇒ 23,214,000 gal. removed
⇒ 54,166,000 gal. remaining

For pumping replacement analysis, assume pumping rate of 700 gpm:
⇒ Current avg. flow: 106,215,000 gal / 700 gpm ⇒ 2,529 hrs of pumping

Remaining flow after rehab: ~~54~~ 106,215,000 − 23,214,000 = 83,001,000 gal/yr.
83,001,000 gal / 700 gpm ⇒ 1,976 hrs. of pumping

Existing Pumps: Ex. pumps are not pumping rated capacity due to age & wear; pumps are estimated to be operating at approx. 75% of original capacity by operators. Assuming an original pumping efficiency of 65% (hydraulic) yields a current hydraulic efficiency of about 50%; with a standard electric motor efficiency of about 85% ⇒ efficiency of approx, 42.5% w/ ex. pumps

New Pumps: 65% hydraulic & 93% premium motor eff. ⇒ 60% efficiency

Power Usage & Costs: Assume power costs of $0.08 per KWH

Ex. Pumps, Ex. Flow: $\frac{(700\text{gpm})(174'\text{TDH})}{(3960)(0.425)}$ (2529 hrs) ⇒ 77,839 KWH x $0.08 ⇒ $6,227
New Pumps, Ex. Flow: $\frac{(700)(74)}{3960(0.60)}$ (2529 hrs) ⇒ 55,136 KWH x $0.08 ⇒ $4,411
Savings: $1,816 (29%)

Ex Pumps, Ex. Flow: ⇒ $6,227
New Pumps, Post Rehab Flow: $\frac{(700)(74)}{3960(0.60)}$ (1976 hrs) ⇒ 43,079 KWH x $0.08 ⇒ 3,446
Savings: $2,781 (45%)

Additional energy savings would also be realized:
1) New pumps will be equipped with VFD's to better match flow to output
2) WWTP cost savings should be realized by the elimination of approx. 23,000,000 gallons of flow per year

Other Benefits will occur by the elimination of excess discharge to surface waters and possible elimination of exfiltration into the groundwater system.